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(54) **METHODS AND SYSTEMS FOR MANAGEMENT AND CONTROL OF AN AUTOMATION CONTROL MODULE**

(76) Inventors: **David Collier**, Charlottesville, VA (US); **Ferrell Mercer**, Earlysville, VA (US); **Bill Hannold**, Charlottesville, VA (US); **Jason Kandingo**, Palmyra, VA (US); **Brad Bolfing**, Charlottesville, VA (US); **Bob Newman**, Barboursville, VA (US); **Carrie Brownhill**, Earlysville, VA (US); **Dave Hietanen**, Charlottesville, VA (US); **Robert Chambers**, Barboursville, VA (US); **David Elliott**, Ruckersville, VA (US)

Correspondence Address:
John S. Beulick
Armstrong Teasdale LLP
One Metropolitan Sq., Suite 2600
St. Louis, MO 63102 (US)

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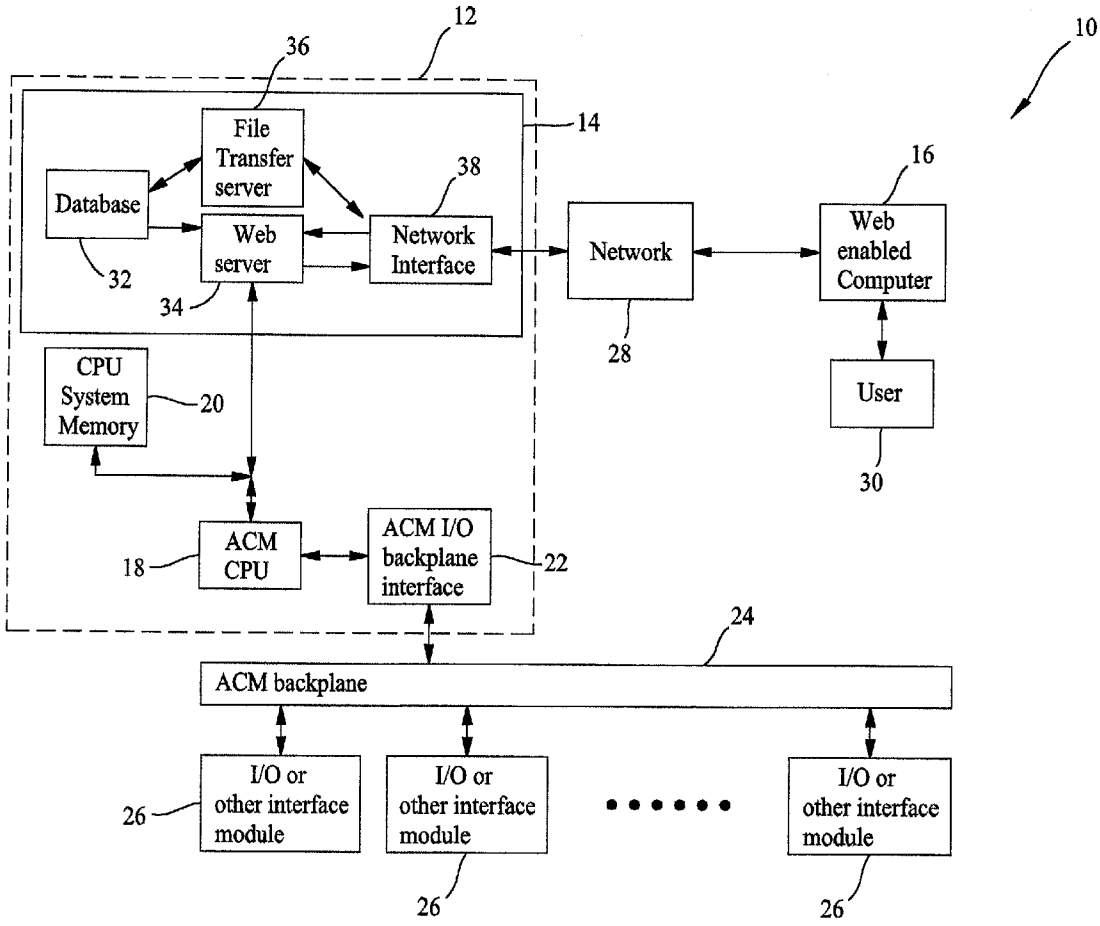
(57) **ABSTRACT**

A web-enabled automation control module (ACM) includes an ACM central processing unit (CPU) and a web and file transfer system electrically connected to the ACM CPU, and embedded within the ACM. The system is configured to process hypertext transfer protocol (HTTP) requests from a network.



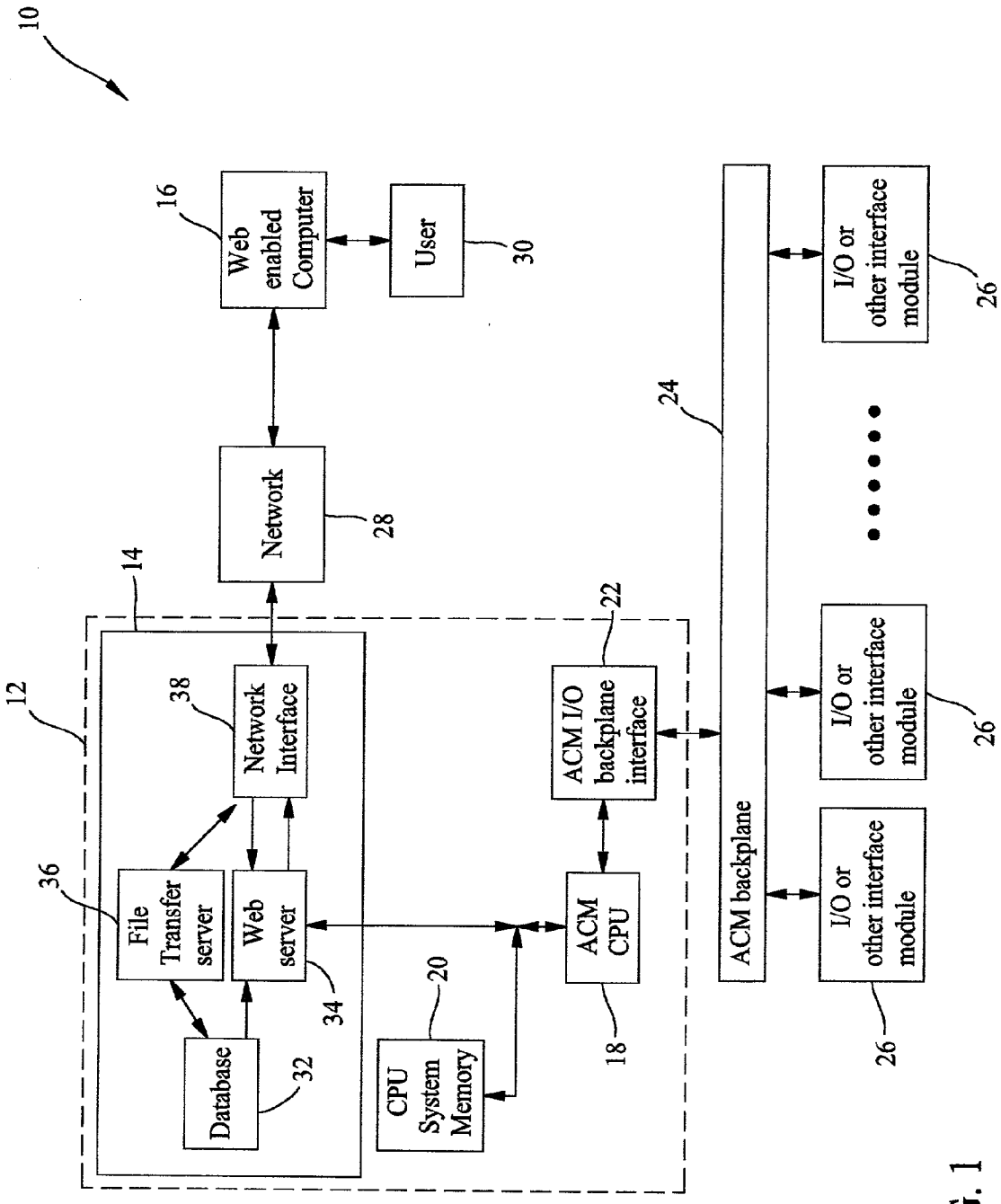
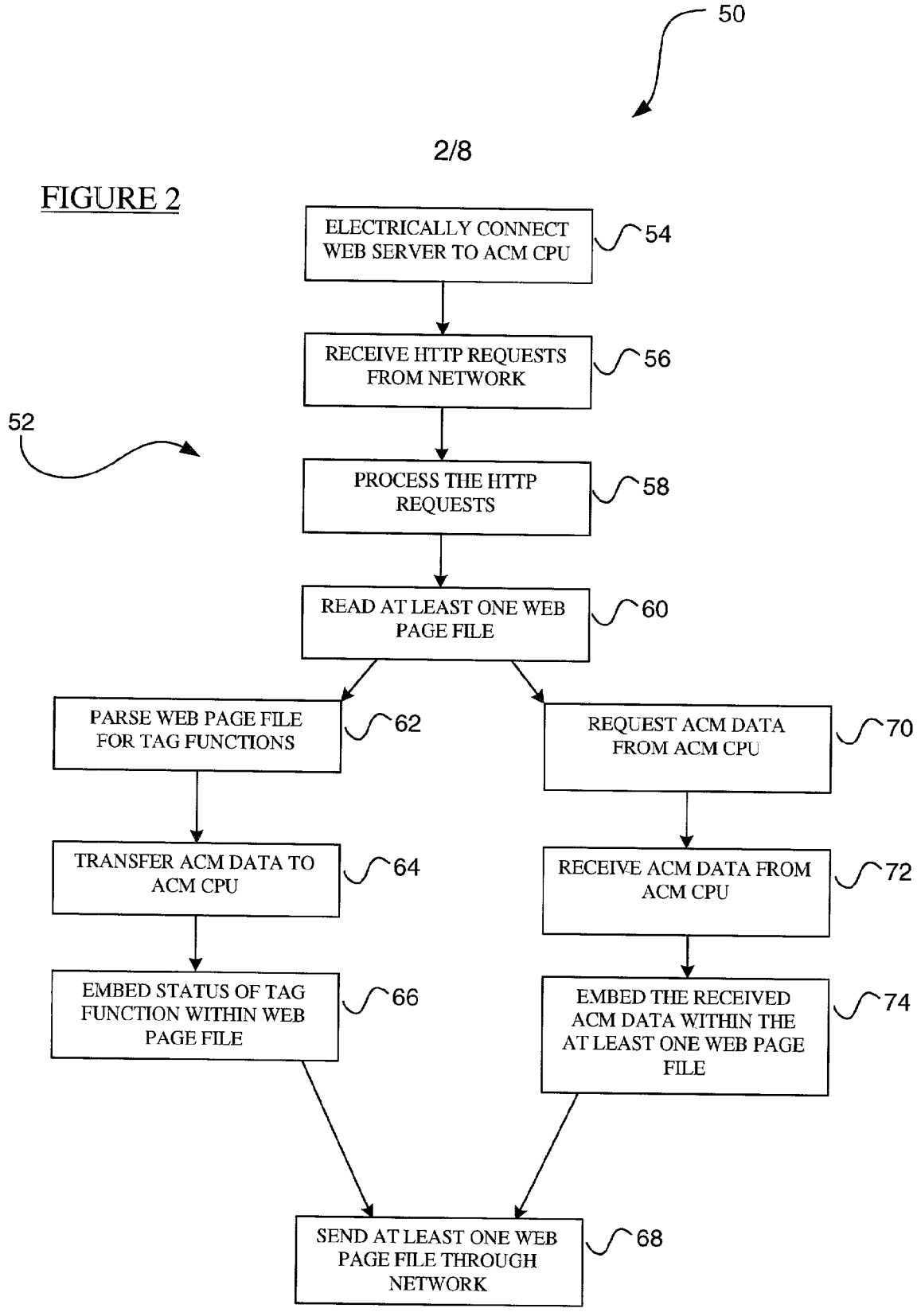

10
16
Web enabled Computer
User
30
Network
28
14
12
38
Network Interface
36
File Transfer server
Web server
34
Database
32
CPU System Memory
20
ACM CPU
18
ACM I/O backplane interface
22
24
ACM backplane
I/O or other interface module
26
I/O or other interface module
26
I/O or other interface module
26

FIG. 1

FIGURE 2


50
52
ELECTRICALLY CONNECT WEB SERVER TO ACM CPU
54
RECEIVE HTTP REQUESTS FROM NETWORK
56
PROCESS THE HTTP REQUESTS
58
READ AT LEAST ONE WEB PAGE FILE
60
PARSE WEB PAGE FILE FOR TAG FUNCTIONS
62
TRANSFER ACM DATA TO ACM CPU
64
EMBED STATUS OF TAG FUNCTION WITHIN WEB PAGE FILE
66
REQUEST ACM DATA FROM ACM CPU
70
RECEIVE ACM DATA FROM ACM CPU
72
EMBED THE RECEIVED ACM DATA WITHIN THE AT LEAST ONE WEB PAGE FILE
74
SEND AT LEAST ONE WEB PAGE FILE THROUGH NETWORK
68

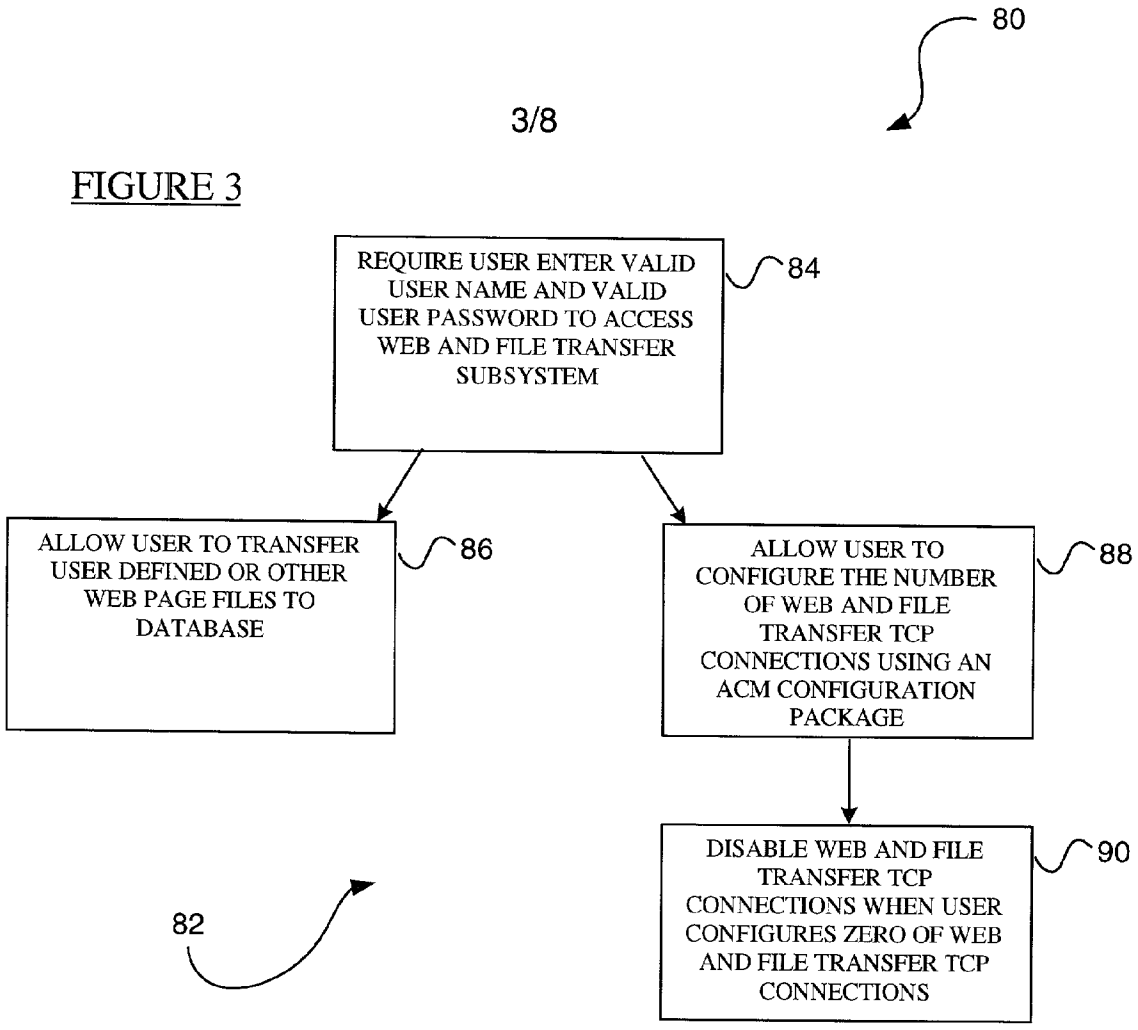
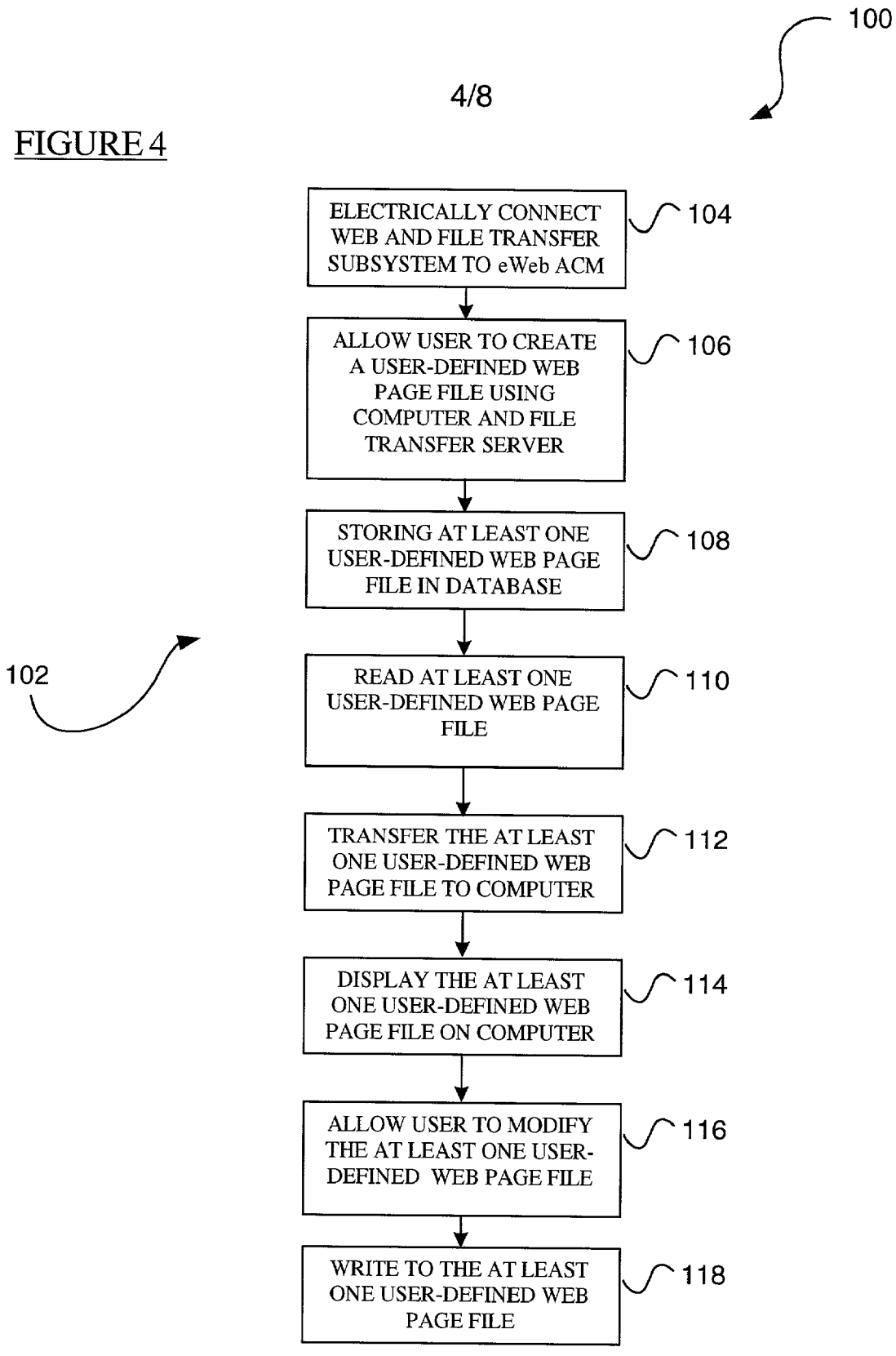

80
3/8
REQUIRE USER ENTER VALID USER NAME AND VALID USER PASSWORD TO ACCESS WEB AND FILE TRANSFER SUBSYSTEM
84
ALLOW USER TO TRANSFER USER DEFINED OR OTHER WEB PAGE FILES TO DATABASE
86
ALLOW USER TO CONFIGURE THE NUMBER OF WEB AND FILE TRANSFER TCP CONNECTIONS USING AN ACM CONFIGURATION PACKAGE
88
DISABLE WEB AND FILE TRANSFER TCP CONNECTIONS WHEN USER CONFIGURES ZERO OF WEB AND FILE TRANSFER TCP CONNECTIONS
90
82

FIGURE 3

FIGURE 4


100
ELECTRICALLY CONNECT WEB AND FILE TRANSFER SUBSYSTEM TO eWeb ACM
104
ALLOW USER TO CREATE A USER-DEFINED WEB PAGE FILE USING COMPUTER AND FILE TRANSFER SERVER
106
STORING AT LEAST ONE USER-DEFINED WEB PAGE FILE IN DATABASE
108
102
READ AT LEAST ONE USER-DEFINED WEB PAGE FILE
110
TRANSFER THE AT LEAST ONE USER-DEFINED WEB PAGE FILE TO COMPUTER
112
DISPLAY THE AT LEAST ONE USER-DEFINED WEB PAGE FILE ON COMPUTER
114
ALLOW USER TO MODIFY THE AT LEAST ONE USER-DEFINED WEB PAGE FILE
116
WRITE TO THE AT LEAST ONE USER-DEFINED WEB PAGE FILE
118

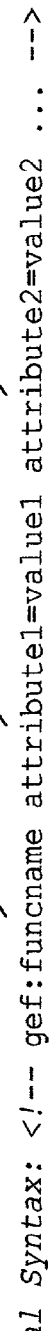

General Syntax: <!-- gef:funcname attribute1=value1 attribute2=value2 ... -->
200
202
204
204
204

FIG. 5

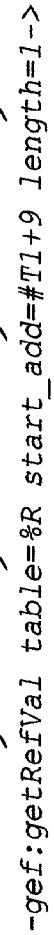

<!--gef:getRefVal table=%R start_add=#T1+9 length=1-->
210
212
214
214
214

FIG. 6

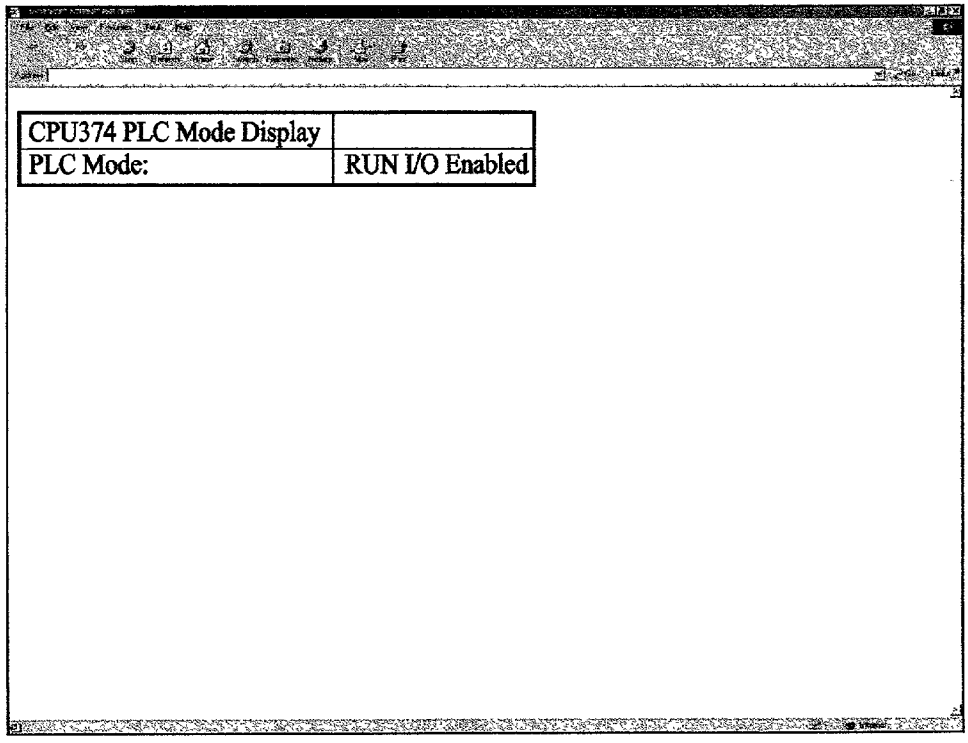


FIG. 7

```
<html>
<head>
<title> CPU374 PLC Mode </title>
</head>
<body>
<table border="1" >
   <tr>
      <td ><b>CPU374 PLC Mode Display</b></td>
   </tr>
   <tr>
      <td >PLC Mode:</td>
      <td ><1-- gef:plcMode --></td>
   </tr>
      </table>
</body>
</html>
```

232

230

FIG. 8

```
<html>

<head>
<title> CPU374 PLC Mode </title>
</head>
<body>
<table border="1" >
   <tr>
      <td ><b>CPU374 PLC Mode Display</b></td>
   </tr>
   <tr>
      <td >PLC Mode:</td>
      <td >Run I/O Enabled</td>
   </tr>
      </table>
</body>
</html>
```

242

240

FIG. 9

```
<html>

<head>
<title>CPU374 PLC Mode </title>
</head>
<body>
<script>
<1-- hide me
var PLC_mode = "<1-- gef:plcMode -->"

// stop hiding -->
</script>
<table border="1" >
  <tr>
    <td >CPU374 PLC Mode Display</td>
   </tr>
  <tr>
    <td >PLC Mode</td>
<script>
<1-- hide me
    document.write("<td>");
    document.write(PLC_mode);
    document.write("</td>");

// stop hiding -->
</script>
  </tr></table></body></html>
```

252

250

FIG. 10

METHODS AND SYSTEMS FOR MANAGEMENT AND CONTROL OF AN AUTOMATION CONTROL MODULE

BACKGROUND OF THE INVENTION

[0001] This invention relates generally to automation control modules (ACMs) and more particularly to management and control of ACMs.

[0002] Known ACM systems access ACM data using an input/output (I/O) module connected to a backplane on the ACM. The I/O module increases the cost of the system and uses additional space in the ACM system cabinet. In addition, if the backplane includes a plurality of modules, the I/O module may respond more slowly.

[0003] Known web-enabled ACM systems also provide pre-defined web pages that contain ACM data in a format determined by the manufacturer. Predefined web pages are inflexible and may be intolerable to many users. Furthermore, known ACM systems that include a web server use the ACM's central processing unit (CPU) to run the web server and the transmission control protocol (TCP)/internet protocol (IP) stack, thereby degrading performance of the CPU.

BRIEF DESCRIPTION OF THE INVENTION

[0004] In one aspect, a web-enabled automation control module (ACM) is provided that includes an ACM central processing unit (CPU) and a web and file transfer system electrically connected to the ACM CPU, and embedded within the ACM. The system is configured to process hypertext transfer protocol (HTTP) requests from a network.

[0005] In another aspect, an automation control module (ACM) system is provided that includes an ACM, a network, a web-enabled computer electrically connected to the network, and a web and file transfer subsystem electrically connected to the ACM and the network. The subsystem is configured to store at least one user-defined web page file.

[0006] In yet another aspect, a method is provided for management and control of an automation control module (ACM). The ACM includes an ACM central processing unit (CPU) and a web and file transfer system embedded within the ACM. The web and file transfer system is electrically connected to a network. The method includes electrically connecting the web and file transfer system to the ACM CPU, and processing hypertext transfer protocol (HTTP) requests from the network using the web and file transfer subsystem.

[0007] In a further aspect, a method is provided for management and control of an automation control module (ACM) using an ACM system. The ACM system includes an ACM, a network, a web-enabled computer electrically connected to the ACM, and a web and file transfer subsystem. The method includes electrically connecting the web and file transfer subsystem to the ACM and the network, and storing at least one user-defined web page.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] **FIG. 1** is a block diagram illustrating one embodiment of an ACM system of the present invention.

[0009] **FIG. 2** is a flow chart illustrating one embodiment of a method for management and control of an automation control module using an ACM system.

[0010] **FIG. 3** is a flow chart illustrating another embodiment of a method for management and control of an automation control module using an ACM system.

[0011] **FIG. 4** is a flow chart illustrating another embodiment of a method for management and control of an automation control module using an ACM system.

[0012] **FIG. 5** is an example of an ACM HTML tag comment.

[0013] **FIG. 6** is an alternative example of an ACM HTML tag comment.

[0014] **FIG. 7** is an example of an HTML web page for retrieving a mode of the ACM of the present invention using HTML and ACM tag functions.

[0015] **FIG. 8** is the HTML for the web page illustrated in **FIG. 6**.

[0016] **FIG. 9** is an HTML for a web page that displays the ACM mode requested in the HTML illustrated in **FIG. 7**.

[0017] **FIG. 10** is an example of an HTML for a web page for retrieving a mode of the ACM of the present invention using HTML, Javascript, and ACM tag functions.

DETAILED DESCRIPTION OF THE INVENTION

[0018] Set forth below are descriptions of embodiments of methods and systems for control and management of an automation control module (ACM). The methods and systems facilitate viewing and controlling ACM data through standard networks, protocols, and browsers, developing and downloading user-defined web pages that include ACM data, and controlling the access level to the ACM and user-defined web pages.

[0019] The methods and systems are not limited to the specific embodiments described herein. In addition, components of each system and steps of each method can be practiced independent and separate from other components and steps described herein. Each component and step can also be used in combination with other components and steps.

[0020] As used herein, the term ACM refers to any device used to control the automation of an activity, including but not limited to PLCs, computer numeric controls (CNCs), motion control products, home automation products, and commercial automation products, for example controls for automated teller machines or car wash systems. As used herein, ACM data includes different types of data within an ACM system **10** that control operation of ACM system **10**. ACM data includes, but is not limited to, user logic programs, user program memory, ACM status and statistics, ACM faults, setting ACM operating states, setting privilege levels, and any other useful ACM information.

[0021] **FIG. 1** illustrates, in block diagram form, hardware architectures that can be utilized in conjunction with an ACM management and control system. The system can be implemented on many different platforms and utilize many different architectures. The architectures illustrated in **FIG. 1** are exemplary only.

[0022] **FIG. 1** is a block diagram illustrating one embodiment of ACM system **10**. System **10** includes an eWeb ACM

12, a web and file transfer subsystem 14, and a web-enabled computer 16. EWeb ACM 12 includes an ACM CPU 18 that carries out ACM functions, for example user logic and function block executions, input/output (I/O) scanning, and communications to other devices. ACM CPU 18 includes a CPU system memory 20 electrically connected to CPU 18 and, in one embodiment, contains both the operating system (not shown) for ACM CPU 18 and a user's program and data. In one embodiment, an ACM I/O backplane interface 22 is connected to ACM CPU 18, and provides an interface between ACM CPU 18 and an ACM backplane 24 connected to interface 22. ACM backplane 24 provides a physical and electrical means for connecting various I/O or other input modules 26, for example communications or motion modules, into eWeb ACM 12. ACM backplane 24 facilitates the exchange of data between modules 26 and ACM CPU 18. In one embodiment, one or more modules 26 provide an interface for real world inputs (not shown), such as limit or proximity switch status, position of an object, temperature, or pressure, to ACM CPU 18 as parameters for logic or function block execution. In another embodiment, one or more modules 26 provide an interface to real world outputs (not shown) as commanded by ACM CPU 18 to control output devices (not shown), such as actuators, contactors, or solenoids.

[0023] Web-enabled computer 16 is electrically connected to a network 28. Network 28 includes the physical medium and intermediate devices (not shown), such as routers, and switches, that connect computer 16 to eWeb ACM 12. In one embodiment, network 28 is a wide area network (WAN), such as the Internet. In an alternative embodiment, network 28 is a local area network (LAN), such as an Intranet. A user 30 accesses, such as dialing into, or directly logging onto, an Intranet or the Internet to gain access to eWeb ACM 12. In one embodiment, computer 16 includes a web browser, and eWeb ACM 12 is accessible to computer 16 via the Internet. Computer 16 is interconnected to the Internet through many interfaces including a different network (not shown), such as a WAN or a LAN, dial in connections, cable modems and special high-speed ISDN lines. Computer 16 is any device capable of interconnecting to the Internet, including a web-based telephone or other web-based connectable equipment.

[0024] Computer 16 displays PLC data on at least one web page (not shown), and retrieves web page files (not shown) stored on a web page file database 32 embedded within web and file transfer subsystem 14. Web page files are text files that may contain hypertext markup language (HTML), Javascript, and/or references to other files, such as image files to be displayed with the web page or Java Applets. In another embodiment, web page files include ACM tag functions that reference ACM data stored in CPU system memory 20. The tag facilitates the exchange of data between ACM CPU 18 and a web server 34 embedded within web and file transfer subsystem 14. Further, the tag provides a generic mechanism for user 30 to display and/or control ACM data with a standard browser. In one embodiment, computer 16 includes web authoring tools and/or text editors that, along with user input, are utilized to create and modify web page files.

[0025] Users 30 include at least one person who views and/or controls ACM data from computer 16. In one embodiment, users 30 include a person who created a web page file. Web and file transfer subsystem 14 is electrically connected to ACM CPU 18, CPU system memory 20, and network 28. Subsystem 14 is shown in FIG. 1 to be embedded within eWeb ACM 12. In an alternative embodiment, subsystem 14 is contained in a separate module connected to backplane 24. Web and file transfer subsystem 14 includes web page file database 32, web server 34, a file transfer server 36, and a network interface 38 that provides the lower level protocols (TCP/IP) and physical hardware connections to network 28. File transfer server 36 is electrically connected to web page file database 32 and network interface 38, and transfers web page files and associated elements between web page file database 32 and computer 16. File transfer server 36 facilitates downloading customizable user 30 defined web pages to eWeb ACM 12 as described below. In one embodiment, file transfer server 36 is a file transfer protocol server.

[0026] Web server 34 is electrically connected to web page file database 32, network interface 38, and ACM CPU 18. Web server 34 receives and processes hypertext transfer protocol (HTTP) requests to send web pages to computer 16 and, based upon the requests, sends the requested web page to computer 16. If the requested web page includes a tag function, web server 34 parses and executes the tag function and either embeds ACM data within a web page file thereby displaying the web page on a browser on computer 16, or transmits ACM data to ACM CPU 18. In one embodiment, web server 34 transfers ACM data to ACM CPU 18 to control operation of eWeb ACM 12.

[0027] In one embodiment, user 30 must enter a valid user name and valid user password to access eWeb ACM 12 and web and file transfer subsystem 14. The user name and user password correspond to a user profile stored in web page file database 32. User 30 configures the number of web and file transfer TCP connections (not shown) using computer 16. A value of zero allows user 30 to disable the web and file transfer TCP connections.

[0028] FIG. 2 is a flow chart 50 illustrating a method 52 for management and control of eWeb ACM 12 (shown in FIG. 1). Method 52 includes electrically connecting 54 web server 34 (shown in FIG. 1) to ACM CPU 18 (shown in FIG. 1). Web server 34 receives 56 HTTP requests from network 28 (shown in FIG. 1) and processes 58 the HTTP requests. In one embodiment, web server 34 processes 58 the HTTP requests, reads 60 at least one web page file (not shown), parses 62 the web page file for tag functions, uses form data from the HTTP request to transfer 64 ACM data to ACM CPU 18 to control operation of eWeb ACM 12, embeds 66 the status of the tag function within the at least one web page file, and sends 68 the at least one web page file through network 28. In another embodiment, web server 34 processes 58 the HTTP requests, reads 60 at least one web page file from database 32, requests 70 ACM data from ACM CPU 18 based on parsing the web page file for tag functions and applying form data from the HTTP request, and receives 72 ACM data from ACM CPU 18. Further, web server 34 embeds 74 the received ACM data within the at least one web page file and sends 68 the at least one web page file through network 28.

[0029] FIG. 3 is a flow chart 80 illustrating a method 82 for management and control of eWeb ACM 12 (shown in FIG. 1) using ACM system 10 (shown in FIG. 1). Method 82 includes requiring 84 user 30 to input a valid user name and valid user password to access web and file transfer

subsystem **14** (shown in **FIG. 1**) and allowing **86** user **30** to transfer user defined or other web page files to database **32**. In another embodiment, method **82** includes allowing **88** user **30** to configure the number of web and file transfer TCP connections (not shown) using an ACM configuration package (not shown). The web and file transfer TCP connections are disabled **90** when user **30** configures zero of the web and file transfer TCP connections.

[**0030**] **FIG. 4** is a flow chart **100** illustrating a method **102** for management and control of eWeb ACM **12** (shown in **FIG. 1**) using ACM system **10** (shown in **FIG. 1**). Method **102** includes electrically connecting **104** web and file transfer subsystem **14** (shown in **FIG. 1**) to eWeb ACM **12**, allowing **106** user **30** to create a user-defined web page file (not shown) using computer **16** (shown in **FIG. 1**) and file transfer server **36** (shown in **FIG. 1**), and storing **108** at least one user-defined web page file in database **32** (shown in **FIG. 1**). File transfer server **36** reads **110** the at least one user-defined web page file stored in database **32**, transfers **112** the at least one user-defined web page file to computer **16**, and displays **114** the at least one user-defined web page file on computer **16**. Computer **16** and file transfer server **36** allow **116** user **30** to modify the at least one user-defined web page file, and file transfer server **36** writes **118** to the at least one user-defined web page file.

EXAMPLES

[**0031**] **FIG. 5** is an example of an ACM HTML tag comment syntax **200** that includes a specified defined function **202**. Tag comment **200** also includes a plurality of attributes **204**, which may be function-specific parameters or general attributes, such as data display requirements.

[**0032**] **FIG. 6** is an alternative example of an ACM HTML tag comment **210** that includes a specified defined function **212**. Tag comment **210** also includes a plurality of attributes **214**.

[**0033**] **FIG. 7** is an example of a web page **220** for retrieving a mode of eWeb ACM **12** using HTML and ACM tag functions.

[**0034**] **FIG. 8** is the HTML **230** for web page **220**. HTML **230** includes an ACM tag function **232** that causes web server **34** to retrieve the ACM mode from eWeb ACM **12**.

[**0035**] **FIG. 9** is an example of an HTML **240** for a web page that displays the ACM mode requested in HTML **230**. HTML **240** includes a return string value **242** from tag function **232**. HTML **240** does not include the ACM tag information.

[**0036**] **FIG. 10** is an example of an HTML **250** for a web page for retrieving a mode of eWeb ACM **12** using HTML, Javascript, and ACM tag functions. HTML **250** includes an ACM tag function **252** that causes web server **34** to retrieve the mode of eWeb ACM **12**.

[**0037**] ACM system **10** provides reduced system hardware costs, rapid development of custom ACM monitoring and control tools that reduce implementation costs, and fast response time accessing ACM data with low impact on other critical real-time ACM functions such as ACM sweep time, thereby reducing production costs. In addition, ACM system **10** facilitates rapid access to ACM data on standard devices such as a web browser on computer **16** or PDA via a standard network.

[**0038**] While the invention has been described in terms of various specific embodiments, those skilled in the art will recognize that the invention can be practiced with modification within the spirit and scope of the claims.

What is claimed is:

1. A web-enabled automation control module (ACM) comprising:

an ACM central processing unit (CPU); and

a web and file transfer system electrically connected to said ACM CPU, said system embedded within said ACM, and configured to process hypertext transfer protocol (HTTP) requests from a network.

2. An ACM in accordance with claim 1 wherein said web and file transfer system comprises a web server electrically connected to said ACM CPU and the network, said web server configured to process HTTP requests from the network.

3. An ACM in accordance with claim 2 wherein said web server configured to receive HTTP requests from the network.

4. An ACM in accordance with claim 3 wherein said web server configured to respond to HTTP requests from the network.

5. An ACM in accordance with claim 4 wherein said web and file transfer system further comprises a database electrically connected to said web server and comprising at least one web page file, said web server configured to read said web page file from said database.

6. An ACM in accordance with claim 2 wherein said web server configured to transfer ACM data from said ACM CPU.

7. An ACM in accordance with claim 2 wherein said web server configured to transfer ACM data to said ACM CPU.

8. An ACM in accordance with claim 5 wherein said web server configured to transfer ACM data from said ACM CPU and embed said ACM data within said at least one web page file based on function tags embedded within said at least one web page file.

9. An ACM in accordance with claim 8 wherein said web server configured to send said at least one web page file through said network using HTTP.

10. An ACM in accordance with claim 1 wherein said web and file transfer system comprises a network interface configured for connection to the network.

11. An ACM in accordance with claim 1 wherein said web and file transfer system further configured to store user defined web pages.

12. An ACM in accordance with claim 1 wherein said ACM comprises a backplane interface electrically connected to said ACM and a backplane electrically connected to said backplane interface, said backplane configured for connection with at least one of an input/output (I/O) module and an input module.

13. An automation control module (ACM) system comprising:

an ACM;

a network;

a web-enabled computer electrically connected to said network; and

a web and file transfer subsystem electrically connected to said ACM and said network, said subsystem configured to store at least one user-defined web page files.

14. An ACM system in accordance with claim 13 wherein said web and file transfer subsystem comprises a database and a file transfer server electrically connected to said network and said database.

15. An ACM system in accordance with claim 14 wherein said database configured to store at least one user-defined web page file, and said file transfer server configured to read and write to said at least one user-defined web page file stored in said database.

16. An ACM system in accordance with claim 14 wherein said file transfer server configured to transfer said at least one user-defined web-page file though said network to said computer.

17. An ACM system in accordance with claim 16 wherein said file transfer server configured to allow a user to perform at least one of create at least one user-defined web-page file and modify at least one user-defined web-page file.

18. An ACM system in accordance with claim 13 wherein said at least one user-defined web page file comprises at least one of hypertext markup language (HTML), Javascript, and references to other files.

19. An ACM system in accordance with claim 18 wherein said references to other files comprise at least one of at least one image file and at least one Applet.

20. An ACM system in accordance with claim 13 wherein said at least one user-defined web page file comprises at least one ACM tag function.

21. An ACM system in accordance with claim 14 wherein said file transfer server is a file transfer protocol server.

22. An ACM system in accordance with claim 14 wherein said web and file transfer subsystem comprises a network interface electrically connected to said file transfer server and said network.

23. An ACM system in accordance with claim 22 wherein said ACM comprises and ACM central processing unit (CPU), said web and file transfer subsystem further comprises a web server electrically connected to said network and said ACM CPU, said ACM, and said database, said web-server configured to process hypertext transfer protocol (HTTP) requests from a network.

24. An ACM system in accordance with claim 13 configured to display at least one user-defined web page file on said computer.

25. An ACM system in accordance with claim 13 wherein a user is required to enter a valid user name and user password to access said ACM system.

26. An ACM system in accordance with claim 25 wherein said user configures the number of web and file transfer TCP connections using said computer.

27. An ACM system in accordance with claim 26 further configured to disable said web and file transfer TCP connections when said user configures zero of said web and file transfer TCP connections.

28. A method for management and control of an automation control module (ACM) including an ACM central processing unit (CPU) and a web and file transfer system embedded within the ACM, the web and file transfer system electrically connected to a network, said method comprising:

electrically connecting the web and file transfer system to the ACM CPU; and

processing hypertext transfer protocol (HTTP) requests from the network using the web and file transfer system.

29. A method in accordance with claim 28 wherein the web and file transfer system includes a web server electronically connected to the ACM CPU and the network, processing HTTP requests from the network using the web and file transfer system comprises processing HTTP requests from the network using the web server.

30. A method in accordance with claim 29 wherein processing HTTP requests from the network using the web server comprises:

receiving HTTP requests from the network using the web server; and

responding to the HTTP requests using the web server.

31. A method in accordance with claim 29 wherein the web and file transfer system further includes a database electrically connected to the web server and including at least one web page file, processing HTTP requests from the network using the web server comprising:

receiving HTTP requests from the network;

reading the at least one web page file from the database;

requesting ACM data from the ACM CPU via function tags embedded within the at least one web page file;

receiving the ACM data from the ACM CPU;

embedding the ACM data within the at least one web page file; and

sending the at least one web page file through the network.

32. A method in accordance with claim 29 wherein processing HTTP requests from the network using the web server comprises transferring ACM data to the ACM CPU using the web server as directed by function tags embedded within the at least one web page file and by form data contained in the HTTP request.

33. A method in accordance with claim 31 wherein the web and file transfer system further includes a file transfer server electrically connected to the database and the network, said method further comprising:

storing at least one user-defined web page in the database;

reading the at least one user-defined web page using the file transfer server and the network; and

writing to the at least one user-defined web page using the file transfer server and the network.

34. A method in accordance with claim 31 wherein the database includes at least one user name and at least one user password, the network includes at least one computer electrically connected to the network, said method further comprising requiring a user input a valid user name and valid user password into the computer to access the web and file transfer system.

35. A method in accordance with claim 34 further comprising;

allowing a user to configure the number of web and file transfer TCP connections using the computer; and

disabling the web and file transfer TCP connections when the user configures zero of the web and file transfer TCP connections.

36. A method for management and control of an automation control module (ACM) using an ACM system, the ACM system including an ACM, a network, a web-enabled computer electrically connected to the ACM, and a web and file transfer subsystem, said method comprising:

electrically connecting the web and file transfer subsystem to the ACM and the network; and

storing at least one user-defined web page file.

37. A method in accordance with claim 36 wherein the web and file transfer subsystem includes a database and a file transfer server electrically connected to the network and the database, storing at least one user-defined web page file comprises storing the at least one user-defined web page file in the database.

38. A method in accordance with claim 37 further comprising:

reading the at least one user-defined web page file stored in the database using the file transfer server; and

writing to the at least one user-defined web page file stored in the database using the file transfer server.

39. A method in accordance with claim 38 wherein reading the at least one user-defined web page file stored in the database using the file transfer server further comprising:

transferring the at least one user-defined web page file to the computer; and

displaying the at least one user-defined web page file on the computer using the file transfer server.

40. A method in accordance with claim 38 wherein writing to the at least one user-defined web page file stored in the database using the file transfer server comprises allowing a user to modify the at least one user-defined web page file using the computer and the file transfer server.

41. A method in accordance with claim 37 further comprising allowing a user to create a user-defined web page file using the computer and the file transfer server.

42. A method in accordance with claim 37 wherein the ACM includes an ACM central processing unit (CPU) and the web and file transfer subsystem further includes a web server electrically connected to the network and the ACM CPU, said method further comprising:

processing hypertext transfer protocol (HTTP) requests from the computer using the web server.

43. A method in accordance with claim 37 wherein the database includes at least one user name and at least one user password, said method further comprising requiring a user input a valid user name and valid user password into the computer to access the web and file transfer subsystem.

44. A method in accordance with claim 43 further comprising;

allowing a user to configure the number of web and file transfer TCP connections using the computer; and

disabling the web and file transfer TCP connections when the user configures zero of the web and file transfer TCP connections.

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